REMARKS

The foregoing amendments and these remarks are in response to the Office Action dated December 2, 2009. Applicant hereby requests a three month extension of time for filing this response. Authorization is given to charge the appropriate fees to Deposit Account No. 50-0951.

At the time of the Office Action, claims 1-10 were pending. Claims 1-10 were rejected under 35 U.S.C. §103(a) as being unpatentable over PCT Publication No. WO01/66465A1 to Moore (hereafter "*Moore*") as applied to claim in view of "Results and Experiences on Revamping of Large-Scale Ammonia Single-Line Plants", page 227, 1989 to Bendix et al. ("*Bendix*") and PCT Publication No. WO99/13963 to Torkilden et al. ("*Torkilden*"), as evidenced by U.S. Patent No. 6,019,820 to Leverett ("*Leverett*"). Claims 2-10 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Moore* as applied to claim in view of *Bendix* and *Torkilden*, for the same rationale recited in prior Office Action dated July 16, 2008.

In support of the non-obviousness rejection, the Office Action combines four different prior art documents related to different technical fields. The need to combine so many unrelated documents strongly supports the non-obviousness and patentability of the claims.

Concerning the subject-matter of claim 1, it is noted that *Moore* uses a dehydrator, and not a gas-liquid mixer. Moreover, the sentence at page 9, line 7-9 of *Moore* has no clear meaning since it does not specifically indicate other possible gas-liquid contacting devices which could fall within the scope of *Moore*. *Moore* solely mentions a dehydrator as the device for contacting the synthesis gas with ammonia, and *Moore* must be understood within this context, that the purpose of the "diffusional exchange" that the gas-liquid contacting devices facilitate is solely for the purpose of dehydrating the vapor stream. In summary of the invention, at page 4, lines 27-33, *Moore* clearly states that the invention utilizes a dehydrator to remove water from synthesis gas and no other means.

Further, claim 1 differs from *Moore* not only because of the use of a gas-liquid mixer but in the type of gas-liquid mixer that is used. Specifically, the claims requires the mixer to have "an axially extending portion of decreasing cross section". Yet further, claim 1 differs from *Moore* in how the mixer is operated, which is that a flow synthesis gas and a flow of pressurized liquid ammonia are fed at the same time into the mixer, the flows being coaxial and in co-current, and

that the method creates a compression of this mixed flow of reactant gases inside the mixer. These features are clearly not taught or suggested by *Moore*.

Even if a person of ordinary skill in the art considered *Bendix* in combination with *Moore*, the person would have not arrived at the claimed method without the exercise of inventive skill. In considering *Bendix*, the Office Action fails to recognized the position of the disclosed Venturi tube, which is downstream of the third stage of the synthesis gas compressor. This corresponds to the exit of the compressor just before the inlet of the synthesis reactor (see for instance page 227, left column, last paragraph). Such a position is thus totally different from the position of the gas-liquid mixer according to the present claims, which is intermediate between two subsequent compression stages and never at the output of the last compression stage.

Such a difference in the position of the gas-liquid mixture plays an important role in terms of technical advantages that can be achieved with the present method and apparatus. In fact, due to the specific position of the gas-mixer device, it is advantageously possible to exploit the great pressure difference (that can be greater than 100 bar) between the pressurized liquid ammonia (i.e. at high pressure) and the synthesis gas still to be compressed (and thus at relatively low pressure), with consequent remarkable energy savings for the subsequent compression of the synthesis gas, if compared to the prior art. Thus, due to this pressure difference, the driving force of the flow of liquid ammonia is advantageously used to enhance the washing of the synthesis gas and at the same time to obtain a compression of such a gas (see also publication at paragraph [0036] or description at page 9, lines 4-11).

To the contrary, according to *Bendix*, the synthesis gas is washed with the liquid ammonia just before being fed to the synthesis reactor (i.e. after the compression stages). In this case, the two fluids have substantially the same pressure and thus no effective washing of the synthesis gas can be obtained. Moreover, *Bendix* is totally silent about the possibility of exploiting the pressure of the liquid ammonia flow in order to save energy for the synthesis gas compression. Thus, any combination of *Moore* with *Bendix* would not arrive at the claimed method or apparatus.

The advantages obtained by the present claims are not taught or suggested by the other cited prior art documents *Torkilden* or *Leverett*, which are merely focused on specific devices such as a Venturi tube or a liquid jet compressor used in totally different applications and for different

purposes than the present method and apparatus. In particular, the devices disclosed in these documents are not in combination with a multi stage compressor for synthesis gas.

Applicant has made every effort to present claims which distinguish over the prior art, and it is thus believed that all claims are in condition for allowance. Nevertheless, Applicant invites the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. In view of the foregoing remarks, Applicants respectfully request reconsideration and prompt allowance of the pending claims.

Respectfully submitted,

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Mark D. Passler
Registration No. 40,764
Sarah E. Smith
Registration No. 50,488
AKERMAN SENTERFITT
Post Office Box 3188
West Palm Beach, FL 33402-3188
Telephone: (561) 653-5000